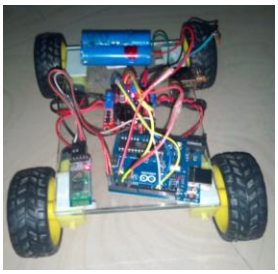
Bluetooth controlled car using Arduino

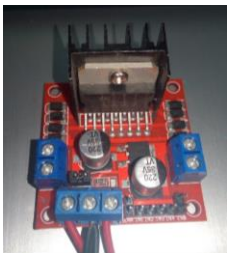


Bluetooth controlled car is controlled by using Android mobile phone instead of any other method like buttons, gesture etc. Here only needs to touch button in android phone to control the car in forward, backward, left and right directions. So here android phone is used as transmitting device and Bluetooth module placed in car is used as receiver. Android phone will transmit command using its in-built Bluetooth to car so that it can move in the required direction like moving forward, reverse, turning left, turning right and stop.

❖ Components required:

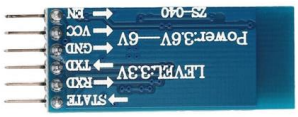
- Arduino UNO
- 4 x DC Motors(BO Motors)
- Bluetooth module HC-05
- Motor Driver L298N
- 3.7 Lithium Ion Battery
- DC Switch
- Glass Sheet (body)

❖ L298N Motor Driver Module



The L298N Motor Driver Module is responsible for providing the necessary drive current to the motors of the robotic car.The L298N is an integrated monolithic circuit in a 15- lead Multiwatt and PowerSO20 packages. It is a high voltage , high current dual full-bridge driver de-signed to accept standard TTL logic level sand drive inductive loads such as relays, solenoids, DC and stepping motors. Two enable inputs are provided to enable or disable the device independently of the in-put signals .The emitters of the lower transistors of each bridge are connected together rand the corresponding external terminal can be used for the connection of an external sensing resistor. An additional Supply input is provided so that the logic works at a lower voltage.

❖ HC-05 Bluetooth Module:



HC-05 Bluetooth Module is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with controller or PC. HC-05 Bluetooth module provides switching mode between master and slave mode which means it able to use neither receiving nor transmitting data.

❖ **Code:**

```
char t;
void setup() {
pinMode(13,OUTPUT);   //left motors forward
pinMode(12,OUTPUT);   //left motors reverse
pinMode(11,OUTPUT);   //right motors forward
pinMode(10,OUTPUT);   //right motors reverse
pinMode(9,OUTPUT);   //Led
Serial.begin(9600);
}
void loop() {
if(Serial.available()){
t = Serial.read();
Serial.println(t);
}
if(t == 'F'){            //move forward(all motors rotate in forward direction)
digitalWrite(13,HIGH);
digitalWrite(11,HIGH);
}
else if(t == 'B'){      //move reverse (all motors rotate in reverse direction)
digitalWrite(12,HIGH);
digitalWrite(10,HIGH);
}
else if(t == 'L'){      //turn right (left side motors rotate in forward direction, right side motors doesn't rotate)
digitalWrite(11,HIGH);
}
else if(t == 'R'){      //turn left (right side motors rotate in forward direction, left side motors doesn't rotate)
digitalWrite(13,HIGH);
}
else if(t == 'S'){      //STOP (all motors stop)
digitalWrite(13,LOW);
digitalWrite(12,LOW);
digitalWrite(11,LOW);
digitalWrite(10,LOW);
}
delay(100);
}
```

❖ Working:

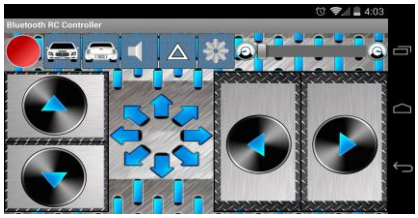
Assemble the robot, make the necessary connections and upload the code to Arduino. If you understood the HC-05 Bluetooth Module tutorial, then understanding the Bluetooth Controlled Robot project is very easy. First, in the Android App, I have used 5 keys as Forward, Reverse, Left, Right and Stop. The corresponding data associated with each key is as follows:

- Forward – F
- Reverse – B
- Left – L
- Right – R
- Stop – S

When a key is pressed, the corresponding data is transmitted to the Bluetooth Module from the Phone over Bluetooth Communication. In the Arduino code, the Arduino UNO receives any of this data from the Bluetooth Module (as per the key pressed) and performs a simple switch case operation, where each case associated with appropriate instructions to the Motor Driver Input Pins.

For example, if 'Forward' key is pressed in the Android Phone, then '1' is transmitted. Arduino will then make IN1 and IN3 as HIGH and IN2 and IN4 as LOW to achieve a forward motion.

❖ Android app (Remote of car):



The app which I used in my car is BLUETOOTH CONTROL CAR .It has nice interface and connect to module very easily also the given code get easily syn with app.

❖ Applications:

- Low range Mobile Surveillance Devices
- Military Applications (no human intervention)
- Assistive devices (like wheelchairs)
- Home automation